

WHAT IS CLAIMED IS:

1. An optical pickup device comprising:
 - a frame;
 - an integrated optical unit incorporated in the frame and equipped with a first semiconductor laser diode;
 - a flexible substrate having a first connector on one end thereof, a second connector on other end thereof, and a first short-circuit wiring pathway connected between the first connector and the second connector; and
 - a driving circuit formed on the flexible substrate for driving the first semiconductor laser diode, wherein the flexible substrate is wound along the frame, so that the first connector of the short-circuit wiring pathway is connected to the optical unit and thereby connected to the semiconductor laser diode, and the second connector is connected to the driving circuit, which allows driving current to be supplied from the driving circuit to the semiconductor laser diode through the short-circuit wiring pathway.
2. An optical pickup device according to claim 1, wherein the first short-circuit wiring pathway is formed as an extension of a substrate and integrally formed with the flexible substrate.
3. An optical pickup device according to claim 1, further comprising:

a second integrated optical unit incorporated in the frame and equipped with a second semiconductor laser diode;

5 a second driving circuit formed on the flexible substrate for driving the second semiconductor laser diode; and

10 a second short-circuit wiring pathway provided on the flexible substrate, connected between a third connector at one end thereof and a fourth connector at the other end thereof, wherein the flexible substrate is wound along the frame, so that the third connector of the second short-circuit wiring pathway is connected to the second integrated optical unit and thereby connected to the second semiconductor laser diode, and
15 the fourth connector is connected to the second driving circuit, which allows driving current to be supplied from the second driving circuit to the second semiconductor laser diode thorough the second short-circuit wiring pathway.

20 4. An optical disk device comprising:

 a frame;

 an integrated optical unit incorporated in the frame and equipped with a first semiconductor laser diode;

25 a rotating motor rotating an optical disk relative to a laser beam emitted from the first semiconductor laser diode mounted on the integrated optical unit

incorporated in the frame;

a flexible substrate having a first connector on one end thereof, a second connector on other end thereof, and a first short-circuit wiring pathway connected between the first connector and the second connector; and

5 a driving circuit formed on the flexible substrate for driving the semiconductor laser diode,

wherein the flexible substrate is wound along the 10 frame, so that the first connector is connected to the integrated optical unit and thereby connected to the semiconductor laser diode, and the second connector is connected to the first driving circuit, which allows driving current to be supplied from the first driving 15 circuit to the semiconductor laser diode thorough the first short-circuit pathway.

5. An optical disk device according to claim 4, wherein the first short-circuit wiring pathway is formed as an extension of a substrate and integrally 20 formed with the flexible substrate.

6. An optical disk device according to claim 4, further comprising:

a second integrated optical unit incorporated in the frame and equipped with a second semiconductor 25 laser diode;

a second driving circuit formed on the flexible substrate for driving the second semiconductor laser

diode; and

a second short-circuit wiring pathway provided on the flexible substrate, connected between a third connector at one end thereof and a fourth connector at the other end thereof, wherein the flexible substrate is wound along the frame, so that the third connector of the second short-circuit wiring pathway is connected to the second integrated optical unit and thereby connected to the second semiconductor laser diode, and the fourth connector is connected to the second driving circuit, which allows driving current to be supplied from the second driving circuit to the second semiconductor laser diode thorough the second short-circuit wiring pathway.

15 7. An optical pickup device comprising:

 a frame;

 an integrated optical unit incorporated in the frame and equipped with a first semiconductor laser diode;

20 a first driving circuit driving the semiconductor laser diode; and

 a flexible substrate connected to the integrated optical unit and the first driving circuit, and having a first wiring path and a second wiring path longer than the first wiring path,

25 wherein the first driving circuit supplies a driving current to the first semiconductor laser diode

thorough the first wiring path, and the second wiring path is ground.

8. An optical pickup device according to claim 7,
wherein the first wiring path is formed as an extension
5 of a substrate integrally formed with the flexible
substrate.

9. An optical pickup device according to claim 7,
wherein the first wiring path connects an anode and
a cathode of the first semiconductor laser diode to the
10 driving circuit.

10. An optical pickup device according to claim 7,
further comprising:

a second integrated optical unit incorporated in
the frame, and equipped with a second semiconductor
15 laser diode emitting a second laser beam to a lens on a
lens actuator;

a second driving circuit driving the second
semiconductor laser diode; and

20 a third wiring path shorter than a fourth wiring
path, provided on the flexible substrate;

wherein the second driving circuit supplies a
driving current to the second semiconductor laser diode
through the third wiring path, and the fourth wiring
path is ground.

25 11. An optical pickup device according to claim 7,
wherein the first semiconductor laser diode of the
first integrated optical unit emits a first laser beam

for recording or reproducing to a DVD, and
the second semiconductor laser diode of the second
integrated optical unit emits a second laser beam for
recording or reproducing to a CD, the second laser beam
5 having a different wavelength from that of the first
laser beam.

12. An optical disk device comprising:
a frame;
an integrated optical unit incorporated in the
10 frame and equipped with a semiconductor laser diode;
a rotating motor which rotates an optical disk
relative to a laser beam emitted from the semiconductor
laser diode mounted on the integrated optical unit;
a first driving circuit driving the semiconductor
15 laser diode; and
a flexible substrate which is connected to the
integrated optical unit and the first driving circuit,
and having a first wiring path and a second wiring path
which is longer than the first wiring path;
20 wherein the first driving circuit supplies a
driving current to the first semiconductor laser diode
through the first wiring path, and the second wiring
path is ground.
13. An optical disk device according to claim 12,
25 wherein the second wiring path is formed as an
extension of a substrate integrally formed with the
flexible substrate.

14. An optical disk device according to claim 12, wherein the second wiring path connects an anode and a cathode of the semiconductor laser diode to the driving circuit.

5 15. An optical disk device according to claim 12, further comprising:

10 a second integrated optical unit incorporated in the frame, and equipped with a second semiconductor laser diode emitting a second laser beam to a lens on a lens actuator;

 a second driving circuit driving the second semiconductor laser diode; and

 a third wiring path shorter than a fourth wiring path, provided on the flexible substrate;

15 wherein the second driving circuit supplies a driving current to the second semiconductor laser diode through the third wiring path, and the fourth wiring path is ground.

20 16. An optical disk device according to claim 15, wherein the first semiconductor laser diode of the first integrated optical unit emits a first laser beam for recording or reproducing to a DVD, and

25 the second semiconductor laser diode of the second integrated optical unit emits a second laser beam for recording or reproducing to a CD, the second laser beam having a different wavelength from that of the first laser beam.

17. A flexible substrate which is wound along a frame, connected to an integrated optical unit incorporated in the frame and equipped with a first semiconductor laser diode, and connected to a driving circuit formed on the flexible substrate for driving the first semiconductor laser diode, comprising:

5 a first connector on one end thereof; and
 a second connector on other end thereof, and a first short-circuit wiring pathway connected between
10 the first connector and the second connector;

15 wherein the flexible substrate is wound along the frame, so that the first connector of the short-circuit wiring pathway is connected to the optical unit and thereby connected to the semiconductor laser diode, and the second connector is connected to the driving circuit, which allows driving current to be supplied from the driving circuit to the semiconductor laser diode through the short-circuit wiring pathway.